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THE PRODUCTION, DISTRIBUTION AND FOOD VALUE OF MILK

A REPORT TO HERBERT C. HOOVER

United States Food Administrator

By

THE MILK COMMITTEE

CLYDE L. KING, Chairman

F. A. PEARSON

G'FFORD PINCHOT

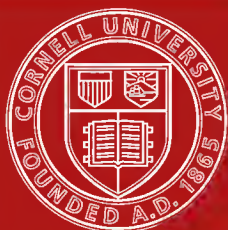
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REPORT OF THE COMMITTEE ON THE PRODUCTION AND DISTRIBUTION OF MILK.

The Committee appointed by the Food Administration to consider the production and distribution of milk for city markets (not including butter, cheese, or condensed milk) submits the following report. The report consists of three parts—production, distribution, and food value of milk.

I. THE PRODUCTION OF MILK.

WAYS OF DETERMINING WHETHER PRICES ARE SUCH AS TO MAINTAIN A NORMAL MILK SUPPLY.

A few of the many facts that indicate whether prices are such as to maintain the milk supply are: The extent of the raising of heifer calves; the extent of the slaughter of dairy cows; prices paid the farmer for dairy products compared with the prices of other farm products; the comparative prices of milk, butter, cheese, and condensed milk; the cost of producing milk; the comparative extent of the movement of labor from dairy farms to cities.

HEIFERS RAISED AND COWS SLAUGHTERED.

If the price of milk is too low, too few heifer calves are raised and cows may be slaughtered. The immediate effect may not be noticed on the milk supply because the reduction in production may be offset by the smaller amount of milk consumed by calves. A reduction in calves raised tends to increase the amount of milk available for two years. Dairying is not a one-year business. If we have too little wheat the area may be increased next year, but it takes several years to raise a dairy cow. Heifers usually freshen for the first time at 24 to 30 months of age, but do not reach their full production until about 5 to 6 years of age. The shortage or excess of milk does not come immediately following too low or too high prices, but usually comes two or four years later.

If dairying is not paying, the farmer can dispose of his poorer cows and heifers by selling them for beef. He is slow to do this because it costs more to raise a dairy cow than she is worth for beef. The farmer has, however, a means of escape even if at a loss, and can substitute other enterprises in his farming operations. On the other hand, if prices of dairy products are too low, and if too few cows are raised

in the entire country, or if too many cows are slaughtered, there is no way to correct the error in less than about 3 or 4 years.

Consideration of all the facts submitted, indicate that if one dairy heifer is saved for each four or five cows kept, the industry probably will be maintained, but one heifer for each six cows seems to be too few.

Most of the reports considered indicate a reduction in the number of heifers now being raised. On April 21, 1917, the Food Supply Commission of New York took an agricultural census of the State. This census showed the following facts:

Heifers under 1 year old (to be raised for dairy cows, April, 1916).....	302,433
Heifers under 1 year old (to be raised for dairy cows, April, 1917).....	224,295
Decrease (per cent).....	26

In August, 1917, reports from 2,500 farms in Connecticut indicate a decrease of 4.5 per cent in dairy cows. A State census in New York in April, 1917, indicated an increase of 3 per cent in dairy cows over 1916. Reports August 1 from 1,441 farmers in New York, keeping 28,167 cows, show that in the four months, April to August, 1,628 cows were sold for slaughter because of failure to breed, poor production, or because of other troubles with the cow; and that 1,304 cows were slaughtered because of high prices for feed, or labor, or because of low prices for milk. Much evidence has been submitted to the committee presenting more or less conflicting opinions. The slaughter of dairy cows was above normal during the late winter and early spring months of 1917.

The reports indicate that the marginal producers are being eliminated somewhat more rapidly than usual.

THE VEAL CALF.

If it is assumed that 90 calves are born alive for each 100 dairy cows, there would be about 45 heifers and 45 bulls. Of the 45 heifers about 20 to 25 are necessary to maintain the supply of cows, and about 5 bulls are probably raised for breeding purposes. In the intensive dairy districts normally all of the others are killed at birth or used for veal.

Restrictions in the production or use of veal do not result in more beef, but in less veal. The dairy bull calf is not a potential beef steer. Farmers rarely veal a calf from a beef cow and rarely raise dairy calves for beef. The commercial veal calf usually is produced in a region where feed is too expensive for beef production.

Whole milk is the only feed that will produce a satisfactory veal. The average milk consumption is given by Eckles as about 13 pounds of whole milk per day for the first month, and the calf gains an average of 1.3 pounds per day. The 13 pounds (6 quarts) of milk contain much more human food than the 1.3 pounds of calf. If the milk costs \$3 a hundred the feed for each pound of gain would cost

30 cents. A veal calf dresses off about one-half, so that the cost to produce each additional pound of dressed veal would be about 60 cents. The sooner the surplus dairy calves not required to maintain the dairy industry are killed for veal, the greater the Nation's food supply.

PRICE OF MILK RELATED TO PRICE OF OTHER FARM PRODUCTS.

The farmer is called on for more grain, more wool, and more beef cattle as well as for more milk. Sheep and beef cattle can use the same pastures and hay that are fed to cows. Much of the hay and pasture land are adapted to the production of grain. Prices of milk must, therefore, bear some relationship to prices of other farm products.

PRICE OF MILK RELATED TO PRICES OF OTHER DAIRY PRODUCTS.

Milk for the city trade sells for more than it is worth for making either cheese, butter, or condensed milk.

The sanitary requirements for market milk make its production more costly than the production of milk for making butter or cheese. Furthermore, milk for the city trade must be produced relatively near cities, where hay and labor are more expensive, and a larger part of it must be produced in winter, at a time of year when feed is expensive. The milk for the manufactured products may be produced on pasture, which is the cheapest feed, and stored for winter use.

SIZE OF DAIRY HERDS.

The average number of cows in New York State in April, 1917, was less than 7 per farm. In 8 counties in New York, in different parts of the State, the majority of the cows were kept in herds of less than 21 cows. In the most intensive dairy section in Illinois investigations in 1912 showed an average of 26 cows per farm. If all the milk-producing regions are included the average number of cows per herd is less. The maintenance of the milk supply is dependent on the success of these small herds.

MILK PRODUCTION PER COW.

The average production in New York State in 1909 has been estimated at 4,900 pounds per cow. The average production per cow is higher on farms selling market milk than for farms selling milk for butter and cheese production. On farms selling market milk estimates have been received from several States, and indicate 5,000 to 5,500 pounds as the average production.

PER CENT OF TOTAL FARM RECEIPTS DERIVED FROM MILK AND MILK PRODUCTS.

In 1912 in the most intensive dairy regions in Illinois (Kane and McHenry Counties) 58 per cent of the income of dairy farms was derived from milk. The other receipts were from crops sold, hogs, and other live stock.

The average for 21 different dairy regions, including 2,015 farms in New York, shows 55 per cent of the receipts coming from the sale of milk and its products, 13 per cent from the sale of cattle, and 32 per cent from the sale of crops, poultry, eggs, and the like.

PER CENT OF CONCENTRATES FOR DAIRY COWS RAISED ON THE FARM.

In 1912 on 174 farms in Delaware County, N. Y., 98.3 per cent of the concentrates fed to cows was purchased. Nor is the eastern dairyman depending directly on western grain, for 95 per cent of the concentrates fed to dairy cows was made up of by-products, such as cottonseed meal, gluten, wheat bran, molasses feeds, beet pulp, and the like. The total grain, including both home-grown and purchased grains in all forms, amounted to only 5 per cent of the concentrates fed.

On 149 farms in Broome County, N. Y., in 1915, only 4 per cent of the concentrates fed to cows consisted of home-grown grain in any form. Of the entire amount of concentrates fed 90 per cent consisted of various by-products.

Even in the corn belt the dairy farmer who sells market milk depends primarily on by-products for concentrates. Of the concentrates fed to 858 cows in Illinois only 45 per cent consisted of grain in any form, either purchased or home-grown. With the present high prices of grain the proportion of by-products in the ration is probably higher. Dairy cows are largely fed on materials not suitable for human food.

COST OF PRODUCING MILK.

The costs here are included for farms producing milk for various city markets in the North. The results are from investigations in six States for 490 farms, keeping 9,761 cows. Five of the States give the milk production in winter. On the average 49.3 per cent was produced in the six months beginning October 1. Five States give the butter-fat production. The average test was 3.7 per cent fat.

The costs of milk production include labor of men and horses; concentrates, including grain; roughage; bedding; interest and taxes on pasture land and maintenance of pasture and fences; interest, taxes, insurance and cost of upkeep of barn; dairy equipment; taxes, interest, insurance and depreciation on cows; cost of keeping a bull; feed grinding; milk hauling; ice, veterinary fees and medicine; salt; kerosene for lanterns; cow testing; whitewash; and many other expenses.

To get the cost of producing milk, credits must be allowed for the value of calves and calf hides, feed bags sold, and for manure.

The costs of production vary widely in different regions because of the differences in the cost of feed and labor, but for herds producing market milk distributed by months according to the city demands

the quantities of feed and hours of labor per 100 pounds of milk, containing the same amount of butter-fat, are fairly uniform in most of the milk districts of the North.

Investigations in Minnesota, Michigan, Massachusetts, Connecticut, New York, and New Jersey, on 490 farms where 9,761 cows were kept, showed the yearly average quantities of food and labor to produce 100 pounds of milk for the different regions to be as below:

- 2.88 hours of labor.
- 33.5 pounds of grain (concentrates).
- 45.3 pounds of hay.
- 11.5 pounds of other dry forage.
- 93.2 pounds of silage.
- 9.4 pounds of other succulent feed.

The above items made 80.8 per cent of the total yearly average net cost of milk after the value of the calf and manure and miscellaneous returns were deducted from the cost. The amount of feed consumed is much more than the average in winter and less in summer. Approximate average yearly costs of production with given prices of feed and labor can be estimated for the above averages. But the costs in summer are much below the average, and in winter are more than the average.

Some estimate of prices to be expected can be made by comparing past prices for different months. The comparative prices paid to producers for milk in different months when the average for the year is 100 per cent have been as follows:

Comparative prices paid to farmers for milk for 10 years ending Oct. 1, 1916.

	Chicago Milk News— Percent- age of yearly average price.	New York “26-cent zone” Milk Report- er—Per- centage of yearly average price.		Chicago Milk News— Percent- age of yearly average price.	New York “26-cent zone” Milk Report- er—Per- centage of yearly average price.
January.....	117.2	119.0	July.....	84.8	81.0
February.....	112.6	114.7	August.....	95.4	90.8
March.....	101.6	106.1	September.....	98.0	96.9
April.....	95.4	93.9	October.....	107.2	110.4
May.....	79.4	79.1	November.....	115.8	119.0
June.....	71.5	70.6	December.....	118.5	120.2

An approximate estimate of prices that might be expected can be made by using the quantities of feed and labor required and the past yearly distribution of price as shown in the accompanying table. For instance, if labor is 25 cents an hour, grain \$55 a ton, hay \$15, other dry forage \$7, silage and other succulent feeds \$6, the average yearly net cost of 100 pounds of 3.7 milk for herds as good as those reported would be \$2.88. If the average price were \$2.88, and if the prices in different months followed the average course, the New York

November price to the farmer might be expected to be approximately \$3.43 (7.37 cents a quart), and the June price \$2.03 (4.36 cents a quart).

If labor is 20 cents, grain \$45, hay \$10, other dry forage \$5, silage and other succulent feeds \$4, the average yearly cost would be \$2.22. If the average price were \$2.22 and if the prices in different months followed the usual course, a November price of approximately \$2.64 might be expected, and a June price of \$1.57.

If labor is worth 30 cents, grain \$65 a ton, hay \$20, other dry forage \$10, silage and other succulent feed \$8, the yearly average cost would be \$3.56. If the average price were \$3.56, and if the distribution by months followed the average course, a November price of approximately \$4.24 (9.12 cents a quart) and a June price of \$2.51 (5.4 cents a quart) might be expected.

On the basis given above the farmer would receive more than the assumed wage in summer and less in winter because the difference in cost between summer and winter, if wages are uniform, is more than the difference in price.

These prices by months are not the cost of production, nor are any of the assumed prices given as applying at the present time, but it is believed that this method of estimating will be of some help in determining whether prices are fair.

The average milk production for the farms here included was 6,181 pounds per cow, or far above the average production. The cost of producing milk in an average herd doubtless is higher than the costs here given.

As in any other industry, a price that just covers the average cost of production would be below the necessary cost for a considerable portion of the industry, and usually will result in decreased production as soon as farmers can readjust their business to better paying things.

Since the feed used for milk production must bring what it is worth on the market, the price that the farmer receives for his milk is primarily a question of what wages he is to receive. Over half of the labor is not the value of hired labor but the value of the farmer's time. The farmer's time is on the average worth more than the hired man's wages.

COST OF PRODUCING MILK IN SUMMER AND WINTER.

Data have been submitted giving the feed used in different months. The feed and labor costs of production on 56 farms, keeping 798 cows, in Broome County, N. Y., that produced milk distributed by months approximately as it is needed for the New York market are given below. Results from Indiana and Illinois showed similar differences between summer and winter. Applying market prices to the feed, it will be seen that farmers receive a much smaller wage for their time in winter than in summer.

Feed and labor per 100 pounds of 4 per cent milk.

	Pasture season.	Winter season.	Yearly average.
Hours of labor.....	2.79	3.77	3.42
Pounds of—			
Grain.....	6.2	41.7	28.1
Hay.....	.3	100.8	62.2
Other dry forage.....	.3	17.7	11.1
Silage.....	6.6	151.9	96.1
Other succulent feed.....	22.0	10.2	14.7

NECESSITY FOR INCREASED MILK PRODUCTION.

Because of the great shortage of dairy cattle that seems inevitable in Europe, our dairy industry should be increased so that America may help to supply Europe with dairy products, not only now but in coming years. Since Europe is not raising enough calves now, it will be two or four years before the shortage of dairy products can be made up by European production. The best way to stimulate immediate production and the raising of heifers is to encourage the largest possible consumption of milk and other dairy products, and encourage the largest possible export of condensed milk, butter, and cheese to our allies. We are looking ahead a year at a time for our wheat supply; we need to look at least three years ahead for our dairy supplies.

II. DISTRIBUTION COSTS.

The committee sent out to all the principal milk dealers of the country whose names were available questionnaires asking for special information as to property account, distribution cost, sales, net earnings, average disposal made of the milk purchased, including surplus, and such general information as the per cent of bottles lost, the means used to increase the return of bottles from the consumer and to decrease the breakage of bottles in the plant. About 45 companies have replied in a form sufficiently definite for use by the committee. The information is all for the six-months' period ending June 30, 1917. These replies have been summarized by districts, as follows:

- A. New York City—Metropolitan district.
- B. New York State (except New York City—Metropolitan district).
- C. Chicago, Boston, Baltimore, and Washington.
- D. Pittsburgh.
- E. Philadelphia.
- F. New England (except Boston).
- G. Milwaukee.
- H. Indiana, Illinois (except Chicago), Iowa, Kentucky, Tennessee, Louisiana, and Missouri.
- I. Ohio.

The diversity in the method of account keeping that exists among the distributors caused a variance in interpretation by certain distributors of the intent of the questions asked and in the formulation of their replies. The committee, therefore, asked the firm of Haskins & Sells to go to the books of those dealers whose answers revealed that they had mistaken the intent of questions or showed other defects and verify the figures from their books. This was done in order to insure uniformity in answer. The distributors whose records were thus inspected handle approximately 430,000,000 quarts of milk, or 84.3 per cent of the 510,000,000 quarts handled by all the dealers reporting. If the distributors' accounts revealed a complete or departmental separation as to fluid milk and its derivative products, such as ice cream (and such separation is decidedly the exception and not the rule in current practice), thus facilitating the ready and reliable exclusion of such derivative products and figures, such separation was adhered to by the accountants in the preparation of their summary. In the great majority of cases, however, the accounts did not reveal such separation and, as it was impracticable to make any arbitrary exclusion, the results of all milk operations, whether of fluid milk or derivative products, were included. Such inclusion is incidentally in the interest of comprehensible results and figures, as the net earnings thus comprise the entire results of operations after taking care of the distributors' surplus problem, which is unavoidably interwoven with the fluid-milk branch of the business. Further, in cases where a separation might have been made as to sales and the cost of the milk content of the product, the remaining expenses would not have permitted a reliable separation.

The unit of quantity has been taken as a milk quart, as no consistent per unit amounts could otherwise be stated. As explained in footnotes on the summary for sales costs and net earnings, "milk quarts" denotes the ordinary quart for milk taken in whole or fluid form, whether sold in that form or sold after conversion into milk derivative products; and for milk products they denote the original quarts of milk from which such products were manufactured. Thus, pounds of butter and quarts of cream were expanded back to the original quantity of milk yielding such products, and for the basis for such expansion the distributors' own experience data was used wherever possible in order to give proper recognition to the butter-fat content of the milk product and the butter-fat percentage of the fluid milk customarily purchased in each case.

Inasmuch as the value shown for milk content comprehends the total quantity purchased and actually disposed of, including loss and shrinkage, the "per quart" amount shown for the item of cost embraces the expense in handling due to such loss and shrinkage.

The committee, of course, made no appraisals of properties. The amounts reported were checked as book values.

The following summaries give the results for the questionnaires in each of the districts concerned. The names of the companies reporting for each district are also given:

DISTRICT A—NEW YORK CITY—METROPOLITAN DISTRICT.

[Reports from H. S. Chardavoyne (Inc.), Brooklyn; Cooke Milk & Cream Co., Brooklyn; Keystone Dairy Co., Hoboken, N. J.; Sheffield Farms Co. (Inc.); Mutual McDermott Dairy Corporation; Borden's Farm Products Co. (Inc.); High Ground Dairy Co.; Locust Farms Co., for six months ended June 30, 1917.]

ASSETS¹ (JUNE 30, 1917).

Operated property, city:

Land.....	\$2,085,891.92
Buildings.....	4,357,817.59
Machinery.....	1,313,119.09
Teams, auto trucks, etc.....	2,352,573.05
Other—cans, bottles, boxes, etc.....	872,277.11
Total.....	\$10,981,678.76

Operated property, country:

Land.....	371,065.64
Buildings.....	3,328,243.78
Machinery.....	1,849,338.86
Teams, auto trucks, etc.....	342,325.35
Other.....	167,161.63
Total.....	6,058,135.26

Investments:

Liquid assets.....	9,664,346.01
Intangible assets, good will, etc.....	1,061,910.00
Other assets.....	653,884.55
Total.....	11,380,140.56

Total assets..... 28,419,954.58

SALES, COSTS, AND NET EARNINGS.¹

	Total.	Per milk quart sold.
Milk quarts ² purchased.....	233,036,168	
Milk quarts ² sold.....	226,638,996	
Net sales.....	\$21,862,543.34	\$0.09846
Cost and expenses:		
Milk content.....	11,481,265.34	.05068
Country expenses (handling, depreciation, etc.; ice, collecting station only; freight).....	1,826,427.26	.00806
Factory expenses (cartage, railroad station to plant; bottling and pasteurization; ice, fuel, and supplies; manufacturing of milk products; depreciation).....	2,320,772.94	.01024
Delivery expenses (horse and wagon maintenance; auto-truck maintenance; drivers, stable, etc.; depreciation, container loss, miscellaneous).....	4,675,612.07	.02063
Selling, administration, and general expenses (advertising and soliciting, insurance and taxes, salaries of executives, other salaries, office expenses, etc.).....	1,059,743.01	.00467
Total cost and expenses.....	21,363,820.62	.09426
Net earnings.....	498,722.72	.00220
Ratio to net sales.....	2.28 per cent.	

¹ All dealers reporting.

² Milk quarts embrace quarts of milk purchased as milk, whether disposed of as milk or converted into milk products; and for milk products (as cream, butter, cheese, etc.) purchased by the dealer in manufactured form, milk quarts represent the original quantity of milk from which such products were manufactured.

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DEPRECIATION.¹

	Amount of depreciation included in expenses.	Annual rate, percentage of book values of pertinent assets.
City:		
Buildings.....	\$51,605.98	2.46
Plant equipment (refrigerator, milk machinery, power).....	60,952.26	4.43
Delivery equipment (horses, wagons, and autos).....	141,733.95	12.08
Containers (bottles, cases, cans).....	256,111.01	51.38
Other.....	11,988.19	5.16
Total city.....	522,481.39	9.74
Country:		
Buildings.....	59,594.22	3.66
Plant equipment.....	69,562.70	7.36
Hauling equipment.....	12,879.11	10.18
Total country.....	142,036.03	5.26
Total.....	664,517.42	8.24

¹ The amounts in this table represent the dealers, four in number, handling 92.51 per cent of the total milk quarts accounted for under sales, costs, and net earnings.

DISPOSAL OF MILK PURCHASED.¹

	Milk quarts.	Percentage of net purchased.
Milk quarts ² purchased—net (representing amount sold and shrinkage in handling).....	217,547,282	
Disposal of milk purchased—net:		
Fluid milk sold retail at prices ranging from 7½ to 12½ cents per quart.....		64.48
Fluid milk sold wholesale at prices ranging from 7 to 8½ cents per quart.....		10.60
Loss or shrinkage (including unexplained differences in quantities reported).....		2.84
Surplus milk:		
Used for butter.....	1,113,962	
Used for cream.....	40,508,106	
Used for condensed milk.....	3,990,957	
Used for cheese.....	2,369,892	
Used for other products.....	42,126	
	48,025,043	22.08
Total.....		100.00

¹ The foregoing amounts represent the dealers, five in number, handling 93.34 per cent of the total milk quarts accounted for under sales, costs, and net earnings.

² See definition in footnote under "Sales," etc.

ROUTE STATISTICS.

Number of retail routes ¹	3,302
Average number of quart points per route.....	252
Number of wholesale routes ²	24
Average number of quart points per route.....	1,307

¹ These amounts represent dealers handling 96 per cent of the total milk quarts accounted for under sales, costs, and net earnings.

² These amounts represent dealers handling 61.10 per cent of the total milk quarts accounted for under sales, costs, and net earnings.

DISTRICT B—NEW YORK STATE (EXCEPT NEW YORK CITY—METROPOLITAN DISTRICT.)

[Reports from Queen City Dairy Co., Buffalo; Geneva Milk Co., Geneva, N. Y.; White Springs Farm Dairy Co., Geneva, N. Y.; Little Falls Dairy Co. (Inc.), Little Falls, N. Y.; Cloverland Dairy Co. (Inc.), Syracuse, N. Y., for six months ended June 30, 1917.]

ASSETS¹ (JUNE 30, 1917).

Operated property, city:

Land.....	\$56,665.40
Buildings.....	116,767.44
Machinery.....	77,399.07
Teams, auto trucks, etc.....	56,404.09
Other—cans, bottles, boxes, etc.....	34,847.99
Total.....	\$342,083.99

Operated property, country:

Land.....	9,300.00
Buildings.....	62,634.86
Machinery.....	56,634.10
Other.....	548.50
Total.....	129,117.46

Investments:

Liquid assets.....	216,450.13
Intangible assets, good will, etc.....	73,140.70
Other assets.....	68,131.68
Total.....	357,722.51

Total assets.....	828,923.96
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SALES, COSTS, AND NET EARNINGS.¹

	Total.	Per milk quart sold.
Milk quarts ² purchased.....	10,979,796	
Milk quarts ² sold.....	10,650,347	
Net sales.....	\$875,764.23	\$0.08222
Cost and expenses:		
Milk content.....	574,379.32	.05393
Country expenses (handling, depreciation, etc.; ice, collecting station only; freight).....	30,048.37	.00282
Factory expenses (cartage, railroad station to plant; bottling and pasteurization; ice, fuel, and supplies; manufacturing of milk products; depreciation).....	74,207.07	.00697
Delivery expenses (horse and wagon maintenance, auto-truck maintenance, drivers, stable, etc.; depreciation, container loss, miscellaneous).....	107,143.49	.01006
Selling, administration, and general expenses (advertising and soliciting; insurance and taxes; salaries of executives; other salaries, office expenses, etc.).....	52,314.52	.00491
Total cost and expenses.....	838,092.77	.07869
Net earnings.....	37,671.46	.00353
Ratio to net sales, 4.30 per cent.		

¹ All dealers reporting.

² Milk quarts embrace quarts of milk purchased as milk, whether disposed of as milk or converted into milk products; and for milk products (as cream, butter, cheese, etc.) purchased by the dealer in manufactured form, milk quarts represent the original quantity of milk from which such products were manufactured.

DEPRECIATION.¹

	Amount of depreciation included in expenses.	Annual rate, percentage of book values of pertinent assets.
City and country:		
Buildings.....	\$2,293.47	2.70
Plant equipment (refrigerator, milk machinery, and power).....	7,351.28	15.42
Delivery equipment (horses, wagons, and autos).....	1,766.24	8.26
Containers (bottles, cases, and cans).....	4,695.74	119.06
Other.....	5.15	10.00
Total.....	16,111.88	9.76

¹ These amounts represent the dealers, four in number, handling 91.46 per cent of the total milk quarts accounted for under sales, costs, and net earnings.

DISPOSAL OF MILK PURCHASED.¹

	Milk quarts.	Percentage of net purchased.
Milk quarts ² purchased—Net (representing amount sold and shrinkage in handling).....	10,042,153	.....
Disposal of milk purchased—Net:		
Fluid milk sold retail, at prices ranging from 9 to 13 cents per quart.....		26.71
Fluid milk sold wholesale, at prices ranging from 6 to 9 cents per quart.....		50.15
Loss or shrinkage (including unexplained differences in quantities reported).....		3.28
Surplus milk—		
Used for butter.....	42,685	.....
Used for cream.....	275,417	.....
Used for cheese.....	1,676,196	.....
	1,994,298	19.86
Total.....		100.00

¹ These items represent four dealers handling 91.46 per cent of the total milk quarts accounted for under sales, costs, and net earnings.

² See definition above.

ROUTE STATISTICS.

Number of retail routes ¹	82
Average number of quart points per route.....	250
Number of wholesale routes ²	12
Average number of quart points per route.....	600

DISTRICT C—CHICAGO, BOSTON, BALTIMORE, AND WASHINGTON.

[Reports from the Bowman Dairy Co., Chicago; Alden Brothers Co., Boston; the City Dairy Co., Baltimore; Corbin Thompson-Sharon Dairy, Washington, D. C., for six months ended June 30, 1917.]

ASSETS² (JUNE 30, 1917).

Operated property—city:	
Land.....	\$247,140.29 (3)
Buildings.....	593,347.83 (4)
Machinery.....	285,702.08 (4)
Teams, auto trucks, etc.....	412,213.73 (4)
Other—cans, bottles, boxes, etc.....	119,909.56 (3)
Total.....	\$1,658,313.49

¹ These items represent dealers handling 70.89 per cent of the total milk quarts accounted for under sales, costs, and net earnings.

² These items represent dealers handling 62.35 per cent of the total milk quarts accounted for under sales, costs, and net earnings.

³ In this table, (2) after any item indicates that only two companies reported, (3) only three companies, (4) all four companies reported.

Operated property—country:

Land.....	\$38, 943. 07 (2)
Buildings.....	354, 529. 51 (2)
Machinery.....	304, 120. 55 (4)

Total..... \$697, 593. 13

Investments:

Liquid assets.....	1, 590, 272. 82 (4)
Intangible assets, good will, etc.....	1, 062, 884. 03 (3)
Other assets.....	485, 081. 80 (4)

Total..... 3, 138, 238. 65

Total assets..... 5, 494, 145. 27

SALES, COSTS, AND NET EARNINGS.¹

	Total.	Per milk quart sold.
Milk quarts ² purchased.....	77, 962, 041	
Milk quarts ² sold.....	77, 056, 255	
Net sales.....	\$5, 896, 923. 34	\$0. 07651
Cost and expenses:		
Milk content.....	3, 521, 575. 65	. 04570
Country expenses (handling, depreciation, etc.; ice, collecting station only, freight).....	30, 014. 93	. 00239
Factory expenses (cartage, railroad station to plant; bottling and pasteurization; ice, fuel, and supplies; manufacturing of milk products; depreciation).....	498, 278. 32	. 00646
Delivery expenses (horse and wagon maintenance; auto truck maintenance; drivers; stable, etc.; depreciation, container loss; miscellaneous).....	961, 045. 36	. 01247
Selling, administration, and general expenses (advertising and soliciting; insurance and taxes; salaries of executives; other salaries, office expenses, etc.).....	463, 048. 51	. 00600
Total cost and expenses.....	5, 473, 962. 77	. 07103
Net earnings.....	422, 960. 57	. 00548
Ratio to net sales, 7. 17 per cent.		

¹All four companies reported on all items save for country expense, for which item three companies reported.

²Milk quarts embrace quarts of milk purchased as milk, whether disposed of as milk, or converted into milk products; and for milk products (as cream, butter, cheese, etc.) purchased by the dealer in manufactured form, milk quarts represent the original quantity of milk from which such products were manufactured.

DEPRECIATION.¹

	Amount of depreciation included in expenses.	Annual rate, percentage of, book values of pertinent assets.
City:		
Buildings.....	² \$6, 942. 98	5. 92
Plant equipment (refrigerator, milk machinery, and power).....	10, 190. 73	11. 81
Delivery equipment (horses, wagons, and autos).....	24, 666. 80	10. 64
Other.....	³ 7, 915. 64	12. 74
Total city.....	49, 716. 15	9. 27
Country:		
Buildings.....	⁴ 7, 750. 45	5. 09
Plant equipment.....	24, 261. 02	11. 40
	32, 011. 47	9. 23
Total.....	81, 727. 62	10. 12

¹ All four dealers reporting save where noted.

DISPOSAL OF MILK PURCHASED.¹

	Milk quarts.	Percent- age of net pur- chased.
Milk quarts purchased—net (representing amount sold and shrinkage in handling) ..	76, 270, 461	.....
Disposal of milk purchased—net:		
Fluid milk sold retail at prices ranging from 9½ to 11 cents per quart		9.88
Fluid milk sold retail at prices ranging from 6 to 9 cents per quart		42.19
Fluid milk sold wholesale at prices ranging from 7½ to 10 cents per quart		3.82
Loss or shrinkage (including unexplained differences in quantities reported) ..		1.18
Surplus milk—		
Used for cream	18, 814, 675	24.66
Used for butter	13, 905, 814	18.23
Used for other products	4, 820	.04
Total	32, 725, 309	100.00

¹ This table is for three companies only.

ROUTE STATISTICS.

Number of retail routes ¹	946 (3)
Average number of quart points, per route ¹	885 (3)
Number of wholesale routes ²	4 (1)
Average number of quart points, per route ²	1, 102 (1)

DISTRICT D—PITTSBURGH.

[Reports from The McJunkin-Straight Dairy Co., Edward E. Rieck Co., Harmony Creamery Co., Ohio
& Pittsburg Milk Co., for six months ended June 30, 1917.]

ASSETS ³ (JUNE 30, 1917).

Operated property—city:

Land	\$188, 000. 00
Buildings	452, 355. 35
Machinery	611, 172. 75
Teams, auto trucks, etc.	302, 551. 03
Other—cans, bottles, boxes, etc	222, 942. 23

Total	\$1, 777, 021. 36
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Operated property—country:

Land	20, 906. 89
Buildings	288, 767. 49
Machinery	284, 818. 56
Teams, auto trucks, etc.	5, 080. 82

Total	599, 573. 76
-------------	--------------

Investments:

Liquid assets	1, 123, 584. 16
Intangible assets, good will, etc.	1, 084, 066. 18
Other assets	43, 526. 33

Total	2, 251, 176. 67
-------------	-----------------

Total assets	4, 627, 771. 79
--------------------	-----------------

¹ For three dealers.² For one dealer.³ All dealers reporting.

SALES, COSTS, AND NET EARNINGS.¹

	Total.	Per milk quart sold.
Milk quarts ² purchased.....	43,828,743	
Milk quarts ² sold.....	42,818,531	
Net sales.....	\$2,720,775.07	\$0.06354
Cost and expenses:		
Milk content.....	1,722,684.89	.04023
Country expenses (handling, depreciation, etc.; ice, collecting station only; freight).....	330,498.53	.00772
Factory expenses (cartage, railroad station to plant; bottling and pasteurization; ice, fuel, and supplies; manufacturing of milk products; depreciation).....	170,181.10	.00397
Delivery expenses (horse and wagon maintenance; auto truck maintenance; drivers; stable, etc.; depreciation; container loss; miscellaneous).....	318,167.81	.00743
Selling, administration, and general expenses (advertising and soliciting; insurance and taxes; salaries of executives; other salaries; office expenses, etc.).....	100,170.86	.00234
Total cost and expenses.....	2,641,705.19	.01169
Net earnings.....	79,069.88	.00185
Ratio to net sales, 2.91 per cent.		

¹ All dealers reporting.

² Milk quarts embrace quarts of milk purchased as milk, whether disposed of as milk or converted into milk products; and for milk products (as cream, butter, cheese, etc.), purchased by the dealer in manufactured form, milk quarts represent the original quantity of milk from which such products were manufactured.

DEPRECIATION.¹

	Amount of depreciation included in expenses.	Annual rate, percentage of book values of pertinent assets.
City:		
Buildings.....	\$6,936.90	3.2
Plant equipment (refrigerator, milk machinery, power).....	17,555.95	7.04
Delivery equipment (horses, wagons, and autos).....	16,133.68	13.20
Other.....	95.35	10.00
Total city.....	40,721.88	6.92
Country:		
Buildings.....	6,874.50	6.90
Plant equipment.....	10,091.25	8.74
Hauling equipment.....	109.00	4.28
Total country.....	17,074.75	7.86
Total.....	57,796.63	7.16

¹ These amounts represent the dealers, three in number, handling 88.88 per cent of the total milk quarts accounted for under sales, costs, and net earnings.

18 PRODUCTION, DISTRIBUTION, AND FOOD VALUE OF MILK.

DISPOSAL OF MILK PURCHASED.¹

	Milk quarts.	Percent- age of net pur- chased.
Milk quarts ² purchased—net (representing amount sold and shrinkage in handling).	43,828,743	.....
Disposal of milk purchased—net:		
Fluid milk sold retail, at prices ranging from 10 to 11 cents per quart.....		17.26
Fluid milk sold wholesale, at prices ranging from 7½ to 9 cents per quart.....		22.14
Loss or shrinkage (including unexplained differences in quantities reported)....		2.30
Surplus milk:		
Used for butter.....	8,660,134	.....
Used for cream.....	12,620,124	.....
Used for buttermilk.....	251,820	.....
Used for cheese.....	1,036,508	.....
Used for other products.....	2,981,684	.....
	25,553,270	58.30
Total.....		100

¹ All dealers reporting.

² See definition above.

ROUTE STATISTICS.

Number of retail routes ¹	157
Average number of quart points per route.....	430
Number of wholesale routes ²	17
Average number of quart points per route.....	925

DISTRICT E—PHILADELPHIA.

[Reports from Scott Powell Dairies, Harbison Dairies, Abbott's Alderney Dairies, Supplee Milk Co., Dolfinger Standard Dairies, Edward W. Woolman, Wills Jones Co., for six months ended June 30, 1917.]

ASSETS JUNE 30, 1917. ³

Operated property:

Land.....	\$146,050.00
Buildings.....	886,698.02
Machinery.....	948,811.84
Teams, auto trucks, etc.....	395,348.14
Other, cans, bottles, boxes, etc.....	139,573.65
Total.....	\$2,516,481.65

Operated property—country:

Land.....	34,642.04
Buildings.....	947,915.68
Machinery.....	433,635.37
Teams, auto trucks, etc.....	69,917.60
Other.....	39,260.41
Total.....	1,525,371.10

Investments:

Liquid assets.....	840,428.44
Intangible assets ⁴	354,629.86
Other assets.....	73,534.08
Total.....	1,268,592.38

Total assets..... 5,310,445.13

¹ These items represent dealers handling 74.01 per cent of the total milk quarts accounted for under sales costs and net earnings.

² These items represent dealers handling 88.88 per cent of the total milk quarts accounted for under sales costs and net earnings.

³ All dealers reporting.

⁴ Exclusive of good will as a book value.

SALES, COSTS, AND NET EARNINGS.¹

	Total.	Per milk quart sold.
Milk quarts purchased ²	67,607,377	
Milk quarts sold ²	65,668,155	
Net sales.....	\$5,423,497.64	\$0.08258
Cost and expenses:		
Milk content.....	2,993,191.89	.04559
Country expenses (handling, depreciation, etc.; ice, collecting station only; freight).....	518,526.22	.00789
Factory expenses (cartage, railroad station to plant; bottling and pasteurization; ice, fuel, and supplies; manufacturing of milk products; depreciation).....	525,300.63	.00801
Delivery expenses (horse and wagon maintenance; auto truck maintenance; drivers; stable, etc.; depreciation; container loss; miscellaneous).....	996,623.63	.01517
Selling, administration, and general expenses (advertising and soliciting; insurance and taxes; salaries of executives; other salaries, office expenses, etc.).....	236,906.35	.00360
Total cost and expenses.....	5,270,548.72	.08026
Net earnings.....	152,948.92	.00232
Ratio to net sales, 2.82 per cent.		

¹ All dealers reporting.

² Milk quarts embrace quarts of milk purchased as milk whether disposed of as milk, or converted into milk products; and for milk products (as cream, butter, cheese, etc.) purchased by the dealer in manufactured form, milk quarts represent the original quantity of milk from which such products were manufactured.

DEPRECIATION.¹

	Amount of depreciation included in expenses.	Annual rate, percentage of book values of pertinent assets.
City:		
Buildings.....	\$17,585.15	4.56
Plant equipment (refrigerator, milk machinery, and power).....	54,273.53	11.32
Delivery equipment (horses, wagons, and autos).....	29,572.12	17.64
Containers (bottles, cases, and cans).....	1,932.64	7.80
Other.....	2,564.90	5.34
Total city.....	105,898.34	9.32
Country:		
Buildings.....	11,409.44	3.14
Plant equipment.....	26,767.37	8.14
Hauling equipment.....	3,495.88	10.00
Other.....	1,496.15	31.58
Total country.....	43,168.84	6.30
Total.....	149,067.18	8.36

¹ All dealers reporting.

DISPOSAL OF MILK PURCHASED.¹

	Milk, quarts.	Percentage of net purchased.
Milk quarts ² purchased, net (representing amount sold and shrinkage in handling).....	58,940,759	-----
Disposal of milk purchased, net:		
Fluid milk sold retail, special grades at prices ranging above 9 cents.....		7.48
Fluid milk sold retail, at 9 cents.....		60.56
Fluid milk sold wholesale, at prices ranging from 6½ to 8 cents per quart.....		5.55
Loss or shrinkage (including unexplained differences in quantities reported).....		3.64
Surplus milk:		
Used for butter.....	2,288,502	-----
Used for cream.....	9,893,686	-----
Used for buttermilk.....	394,664	-----
Used for cheese.....	40,252	-----
Used for other products.....	744,558	-----
Total.....	13,361,652	22.77
Total.....		100.00

ROUTE STATISTICS.

Average number of quarts per retail route ¹	299
Average number of quarts per wholesale route ²	1,184

DISTRICT F—NEW ENGLAND (EXCEPT BOSTON).

[Reports from Deerfoot Farms Dairy, Southboro, Mass.; The Bryant & Chapman Co., Hartford, Conn.; Somers Creamery Co., Springfield, Mass., for six months ended June 30, 1917.]

ASSETS ¹ (JUNE 30, 1917).

Operated property—City:

Land.....	\$27,983.24
Buildings.....	64,279.69
Machinery.....	51,721.99
Teams, auto trucks, etc.....	43,034.54
Other—cans, bottles, boxes, etc.....	2,474.50
Total.....	\$189,493.96

Operated property—Country:

Land.....	7,381.39
Buildings.....	34,674.02
Machinery.....	25,690.25
Teams, auto trucks, etc.....	9,464.89
Other.....	575.97
Total.....	77,786.52

Investments:

Liquid assets.....	153,710.60
Other assets.....	37,605.21
Total.....	191,315.81
Total assets.....	458,596.29

SALES, COSTS, AND NET EARNINGS.¹

	Total.	Per milk quart sold.
Milk quarts ² purchased.....	6,468,703	
Milk quarts ² sold.....	6,345,334	
Net sales.....	\$519,835.33	\$0.08192
Cost and expenses:		
Milk content.....	358,853.97	.05555
Country expenses (handling, depreciation, etc.; ice, collecting station only; freight).....	35,127.63	.00553
Factory expenses (cartage, railroad station to plant; bottling and pasteurization; ice, fuel, and supplies; manufacturing of milk products; depreciation.....	41,523.14	.00654
Delivery expenses (horse and wagon maintenance; auto truck maintenance; drivers; stable, etc.; depreciation; container loss; miscellaneous).....	51,065.62	.00805
Selling, administration, and general expenses (advertising and soliciting; insurance and taxes; salaries of executives; other salaries, office expenses, etc.).....	23,398.17	.00369
Total cost and expenses.....	503,968.53	.08036
Net earnings.....	9,866.80	.00156
Ratio to net sales, 1.99 per cent.		

¹ All dealers reporting.² This item represents dealers handling 42.05 per cent of the total milk quarts accounted for under sales, costs, and net earnings.³ Milk quarts embrace quarts of milk purchased as milk, whether disposed of as milk, or converted into milk products; and for milk products (as cream, butter, cheese, etc.) purchased by the dealer in manufactured form, milk quarts represent the original quantity of milk from which such products were manufactured.

DEPRECIATION.¹

	Amount of depreciation included in expenses.	Annual rate, percentage of book values of pertinent assets.
City:		
Buildings.....	\$449.38	2.14
Plant equipment (refrigerator, milk machinery, and power).....	1,553.97	9.44
Delivery equipment (horses, wagons, and autos).....	1,894.27	12.24
Other.....	37.12	3.00
Total city.....	3,934.74	7.26
Country:		
Plant equipment.....	918.00	10.12
Hauling.....	2,080.00	48.10
Total country.....	2,998.00	22.38
Total.....	6,932.74	10.24

¹ These amounts represent dealers handling 76.69 per cent of the total milk quarts accounted for under sales, costs, and net earnings.

DISPOSAL OF MILK PURCHASED.¹

	Milk quarts.	Percentage of net purchased.
Milk quarts ² purchased, net (representing amount sold and shrinkage in handling).....	4,960,951	
Disposal of milk purchased, net:		
Fluid milk sold retail, at prices ranging from 10 to 11 cents per quart.....		21.17
Fluid milk sold wholesale, at prices ranging from 6½ to 9½ cents per quart.....		50.68
Loss or shrinkage (including unexplained differences in quantities reported).....		2.49
Surplus milk:		
Used for butter.....	40,640	
Used for cream.....	1,232,425	
	1,273,065	25.66
Total.....		100.00

¹ These amounts represent dealers handling 76.69 per cent of the total milk quarts accounted for under sales, costs, and net earnings.

² See definition above.

ROUTE STATISTICS.

Number of retail routes ¹	37
Average number of quart points per route.....	242
Number of wholesale routes ²	14
Average number of quart points per route.....	797

¹ All dealers reporting.

² This item represents dealers handling 66.22 per cent of the total milk quarts accounted for under sales, costs, and net earnings.

DISTRICT G—MILWAUKEE.

[Reports from Gridley Dairy Co., Cedarburg Milk Co., Union Dairy Co., for six months ended June 30, 1917.]

ASSETS¹ (JUNE 30, 1917).

Operated property—city:

Land.....	\$95,922.00
Buildings.....	359,682.22
Machinery.....	135,188.60
Teams, auto trucks, etc.....	114,134.65
Other—cans, bottles, boxes, etc.....	58,912.44
Total.....	\$763,839.91

Investments:

Liquid assets.....	237,900.93
Intangible assets, good will, etc.....	6,638.29
Other assets.....	75,001.95
Total.....	319,541.17

Total assets..... 1,083,381.08

SALES, COSTS, AND NET EARNINGS.¹

	Total.	Per milk quart sold.
Milk quarts ² purchased.....	30,327,505	
Milk quarts ² sold.....	30,067,999	
Net sales.....	\$1,791,493.23	\$0.05957
Cost and expenses:		
Milk content.....	1,309,985.81	.04356
Country expenses (handling, depreciation, etc.; ice, collecting station only; freight).....		
Factory expenses (cartage, railroad station to plant; bottling and pasteurization; ice, fuel, and supplies; manufacturing of milk products; depreciation).....	111,003.24	.00369
Delivery expenses (horse and wagon maintenance; auto truck maintenance; drivers; stable, etc.; depreciation; container loss; miscellaneous).....	217,948.54	.00725
Selling, administration, and general expenses (advertising and soliciting; insurance and taxes; salaries of executives; other salaries, office expenses, etc.).....	102,343.20	.0034
Total cost and expenses.....	1,741,280.79	.05790
Net earnings.....	50,212.44	.00167
Ratio to net sales, 2.80 per cent.		

DEPRECIATION.³

	Amount of depreciation included in expenses.	Annual rate, percentage of book values of pertinent assets.
City and country:		
Buildings.....	\$3,806.91	2.12
Plant equipment (refrigerator, milk machinery, and power).....	4,015.22	5.66
Delivery equipment (horses, wagons, and autos).....	8,094.63	15.58
Containers (bottles, cases, and cans).....	4,122.97	63.18
Total.....	20,039.73	6.48

¹ All dealers reporting.² Milk quarts embrace quarts of milk purchased as milk, whether disposed of as milk or converted into milk products; and for milk products (as cream, butter, cheese, etc.) purchased by the dealer in manufactured form, milk quarts represent the original quantity of milk from which such products were manufactured.³ These amounts represent dealers handling 98.51 per cent of the total milk quarts accounted for under sales, costs, and net earnings.

DISPOSAL OF MILK PURCHASED.¹

	Milk quarts.	Percent- age of net pur- chased.
Milk quarts ² purchased—net (representing amount sold and shrinkage in handling).....	30,327,505	
Disposal of milk purchased—net:		
Fluid milk sold retail, at prices ranging from 8 to 10 cents per quart.....		25.79
Fluid milk sold wholesale, at prices ranging from 7 to 8 cents per quart.....		26.19
Loss or shrinkage (including unexplained differences in quantities reported).....		.86
Surplus milk:		
Used for butter.....	8,127,990	
Used for cream.....	6,108,236	
Used for cheese.....	65,704	
	14,301,930	47.16
Total.....		100.00

¹ All dealers reporting.² See definition above.ROUTE STATISTICS.¹

Number of retail routes.....	162
Average number of quart points per route.....	299
Number of wholesale routes.....	25
Average number of quart points per route.....	991

DISTRICT H—INDIANA, ILLINOIS (EXCEPT CHICAGO), IOWA, KENTUCKY, TENNESSEE, LOUISIANA, AND MISSOURI.

(Reports from Polk Sanitary Milk Co., Indianapolis, Ind.; Evansville Pure Milk Co., Evansville, Ind.; Cloverlands Dairy Co., New Orleans, La.; Nashville Pure Milk Co., Nashville, Tenn.; D. H. Ewing's Sons, Louisville, Ky.; Union Dairy Co., Rockford, Ill.; Des Moines Milk Co., Des Moines, Iowa; Pevely Dairy Co., St. Louis, Mo., for six months ended June 30, 1917.)

ASSETS ² (JUNE 30, 1917).

Operated property—city:

Land.....	\$48,962.30	
Buildings.....	606,700.01	
Machinery.....	221,554.65	
Teams, auto trucks, etc.....	175,577.00	
Other—cans, bottles, boxes, etc.....	53,337.17	
Total.....		\$1,106,131.13

Operated property—country:

Land.....	5,040.00	
Buildings.....	23,914.59	
Machinery.....	3,029.36	
Teams, auto trucks, etc.....	3,631.38	
Other.....	25,231.06	
Total.....		60,846.39

Investments:

Liquid assets.....	352,994.16	
Intangible assets, good will, etc.....	12,238.00	
Other assets.....	29,680.10	
Total.....		394,912.26
Total assets.....		1,561,889.78

¹ These amounts represent dealers handling 81.95 per cent of the total milk quarts accounted for under sales, costs, and net earnings.

² All dealers reporting.

24 PRODUCTION, DISTRIBUTION, AND FOOD VALUE OF MILK.

SALES, COSTS, AND NET EARNINGS.¹

	Total.	Per milk quart sold.
Milk quarts ² purchased.....	20,497,020	
Milk quarts ² sold.....	19,559,527	
Net sales.....	\$1,704,447.60	\$0.08714
Cost and expenses:		
Milk content.....	1,012,690.37	.05177
Country expenses (handling, depreciation, etc.; ice, collecting station only; freight).....	61,217.53	.00313
Factory expenses (cartage, railroad station to plant; bottling and pasteurization; ice, fuel, and supplies; manufacturing of milk products; depreciation).....	143,149.10	.00732
Delivery expenses (horse and wagon maintenance; auto truck maintenance; drivers; stable, etc.; depreciation; container loss; miscellaneous).....	242,075.95	.01233
Selling, administration, and general expenses (advertising and soliciting; insurance and taxes; salaries of executives; other salaries; office expenses, etc.).....	182,748.76	.00934
Total cost and expenses.....	1,641,881.71	.08394
Net earnings.....	62,565.89	.00320
Ratio to net sales, 3.67 per cent.		

¹ All dealers reporting.

² Milk quarts embrace quarts of milk purchased as milk, whether disposed of as milk or converted into milk products; and for milk products (as cream, butter, cheese, etc.) purchased by the dealer in manufactured form, milk quarts represent the original quantity of milk from which such products were manufactured.

DEPRECIATION.¹

	Amount of depreciation included in expenses.	Annual rate, percentage of book values of pertinent assets.
City:		
Buildings.....	\$7,977.01	2.18
Plant equipment (refrigerator, milk machinery, and power).....	13,052.86	1.42
Delivery equipment (horses, wagons, and autos).....	16,304.59	21.81
Other.....	495.08	4.46
Total city.....	37,829.54	8.84
Country:		
Buildings.....	447.88	5.00
Handling equipment.....	1,348.00	10.68
Total country.....	1,795.88	8.32
Total.....	39,625.42	8.80

¹ These amounts represent the dealers (5 in number) handling 85.05 per cent of the total milk quarts accounted for under sales, costs, and net earnings.

DISPOSAL OF MILK PURCHASED.¹

	Milk quarts.	Percentage of net purchased.
Milk quarts ² purchased—net (representing amount sold and shrinkage in handling).....	17,853,316	.....
Disposal of milk purchased—net:		
Fluid milk sold retail, at prices ranging from 8 to 12 cents per quart.....		81.22
Fluid milk sold wholesale, at prices ranging from 7 to 8 cents per quart.....		10.85
Loss or shrinkage (including unexplained differences in quantities reported).....		3.65
Surplus milk—		
Used for butter.....	316,491	
Used for cream.....	267,735	
Used for buttermilk.....	66,630	
Total.....	650,856	4.28
Total.....		100.00

¹ These amounts represent dealers handling 87.1 per cent of the total milk quarts accounted for under sales, costs, and net earnings.

² See definition above.

ROUTE STATISTICS.

Number of retail routes ¹	233
Average number of quart points per route.....	268
Number of wholesale routes ²	12
Average number of quart points per route.....	1, 558

DISTRICT J—OHIO.

[Reports from Licking Creamery Co., Newark; Akron Pure Milk Co., Akron; The Moores & Ross Milk Co., Columbus; Alliance Sanitary Milk Co., Alliance, for six months ended June 30, 1917.]

ASSETS ³ (JUNE 30, 1917).

Operated property—city:

Land.....	\$42, 939. 05
Buildings.....	145, 557. 57
Machinery.....	233, 708. 34
Teams, auto trucks, etc.....	74, 537. 03
Other—cans, bottles, boxes, etc.....	27, 698. 28
Total.....	\$524, 440. 27

Operated property—country:

Buildings.....	12, 535. 93
Machinery.....	17, 741. 84
Total.....	30, 277. 77

Investments:

Liquid assets.....	184, 697. 48
Intangible assets, good will, etc.....	87, 868. 11
Other assets.....	286, 886. 37
Total.....	559, 451. 96

Total assets.....	1, 114, 170. 00
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SALES, COSTS, AND NET EARNINGS.⁴

	Total.	Per milk quart sold.
Milk quarts ⁴ purchased.....	19, 548, 298	
Milk quarts ⁴ sold.....	18, 130, 061	
Net sales.....	\$867, 464. 90	\$0 04784
Cost and expenses:		
Milk content.....	572, 065. 43	. 03155
Country expenses (handling, depreciation, etc.; ice, collecting station only; freight).....		
Factory expenses (cartage, railroad station to plant; bottling and pasteurization; ice, fuel, and supplies; manufacturing of milk products; depreciation).....	113, 541. 60	. 00626
Delivery expenses (horse and wagon maintenance; auto-truck maintenance; drivers; stable, etc.; depreciation; container loss: miscellaneous).....	127, 123. 51	. 00701
Selling, administration, and general expenses (advertising and soliciting; insurance and taxes; salaries of executives; other salaries, office expenses, etc.).....	32, 031. 14	. 00177
Total cost and expenses.....	\$44, 761. 68	. 04659
Net earnings.....	22, 703. 22	. 00125
Ratio to net sales, 2.62 per cent.		

¹ These items represent dealers handling 91.35 per cent of the total milk quarts accounted for under sales, costs, and net earnings.

² These items represent dealers handling 17.48 per cent of the total milk quarts accounted for under sales, costs, and net earnings.

³ All dealers reporting.

⁴ Milk quarts embrace quarts of milk purchased as milk, whether disposed of as milk or converted into milk products; and for milk products (as cream, butter, cheese, etc.), purchased by the dealer in manufactured form, milk quarts represent the original quantity of milk from which such products were manufactured.

DEPRECIATION.¹

	Amount of depreciation included in expenses.	Annual rate, percentage of book values of pertinent assets.
City and country:		
Buildings.....	\$1,443.94	2.10
Plant equipment (refrigerator, milk machinery, and power).....	8,630.30	7.10
Delivery equipment (horses, wagons, and autos).....	7,585.40	20.34
Other.....	584.43	4.70
Total.....	18,244.07	7.60

¹ All dealers reporting.DISPOSAL OF MILK PURCHASED.¹

	Milk, quarts.	Percentage of net purchased.
Milk quarts ² purchased—net (representing amount sold and shrinkage in handling).....	19,548,298	.....
Disposal of milk purchased, net:		
Fluid milk sold retail, at prices ranging from 8 to 11 cents per quart.....		46.99
Fluid milk sold wholesale, at prices ranging from 6½ to 9 cents per quart.....		30.89
Loss or shrinkage (including unexplained differences in quantities reported).....		7.25
Surplus milk:		
Used for butter.....	164,676	
Used for cream.....	2,037,951	
Used for other products.....	703,823	
	2,906,450	14.87
Total.....		100.00

¹ All dealers reporting.² See definition above.ROUTE STATISTICS.¹

Number of retail routes.....	52
Average number of quart points per route.....	361
Number of wholesale routes.....	13
Average number of quart points per route.....	971

CONCLUSIONS AND RECOMMENDATIONS.

The committee invites attention to the following deductions from the above reports and other information examined by the committee.

1. The per cent of earnings to net sales during this six-months period ranges from 1.90 to 7 per cent, with an average of around 3.33 per cent. The net earnings per quart ranges from 0.125 to 0.548 cent with an average of 0.256 cent per quart. This is for 45 companies with a total quartage for the six months of 510,000,000 quarts. Figured on the investments reported the percentage is likewise not high. This would still be true even if all intangible assets and good will were excluded. We have to remember that this six-months period was a period of rising prices. The distributor was hesitating

¹ These amounts represent dealers handling 82.53 per cent of the total milk quarts accounted for under "Sales, costs, and net earnings."

to charge the consumer more, as higher prices to the consumer means diminished consumption. The period from January to June in most cases is the period of greater profits, as the period from July to January includes the seasonal surplus and the season of greatest scarcity.

2. An examination as to the number of bottles not returned by consumers and the number broken in the plant indicates that something more than 50 per cent of the entire loss of bottles is due to the negligence on the part of the consumers in returning bottles, while less than 50 per cent, roughly 40, is due to breakage in plant. That this loss in bottles is significant is shown by the fact that the life of a bottle varies from 20 to 30 trips. Bottles cost during this period about 4 cents each for quart bottles. Consumers can lower this cost by taking greater care to return bottles, and no doubt the distributors by better efficiency methods can somewhat lower breakage in the plant. As bottles are fragile, they of course will be broken. But the average life of a bottle could be greatly increased by conscientious efforts on the part of the milk consumers. It may be better for wholesale dealers particularly to charge for bottles not returned.

3. The cost of distribution to the consumer after pasteurization and after the milk has reached the city, according to the reports, ranges from 0.701 to 2.063 cents, with an average of 1.116 cents per quart. This cost can be lowered to a certain degree by the elimination of duplication of routes. Possibly certain other costs might in some instances be materially lowered, such as doing away with the duplication of property in country districts. The savings effected by doing away with the duplication of routes within the city will vary from city to city, depending upon the extent to which the dealers have already practically a monopoly of certain zones within the city. The oft-repeated illustration of from 6 to 20 milk wagons on the same street is certainly the exception under present conditions and not the rule. The number now actually traversing the same streets in the same city is much less than is popularly believed. This duplication can largely be done away with. The committee believes that the future of milk distribution is essentially that of a public utility, each vicinity having its zone monopoly. This end can be approached through the licensing of distributors.

4. The committee is unanimously of the opinion that many of the laws regulating the sale of milk are superfluous under present conditions and should be repealed. The committee urges every locality to examine anew in the light of present-day facts all its ordinances and regulations created for the ostensible object of protecting the supply of milk with the view of making these regulations simple and of reducing all unnecessary costs of milk production and distribution.

5. The committee likewise unanimously recommends that the laws of the various States and cities be so amended as to allow standardization of milk. By this we mean that the per cent of butter fat and of solids other than fat can be standardized. The committee earnestly recommends, however, that when standardization is authorized it be authorized only with the accompanying requirement that the per cent of butter fat contained in the milk be placed upon the stopper of the milk bottle, and that adequate guaranties be required to make certain that these standards are lived up to. Standardization would, for instance, make it possible to sell 3 per cent milk at a minimum price.

6. We further believe that the number of grades of milk should be reduced to not lower than two or three, exclusive of certified milk and skimmed milk.

III. THE FOOD VALUE OF MILK.¹

THE ACTUAL FOOD VALUE OF MILK IN FEEDING THE FAMILY.

1. Milk is the ideal food for infants.
2. Milk is the best single kind of food for the proper development of growing children.
3. Milk is necessary in any family dietary that is based on the welfare of adults.
4. Milk has these values to the health and development of the family because it meets the nutritive needs of the human body in the following way:

A. *As a source of energy.*—Besides being an important source of energy, two of the energy-yielding substances of milk, namely, milk sugar and milk fat, have further significance in the dietary as body regulatory and growth-producing factors.

B. *For the growth and repair of body tissues*, milk furnishes many substances, including—

(a) Milk proteins that have a higher efficiency for tissue restoration and growth than almost any of the other common foods such as corn or wheat.

¹ LITERATURE AND SOURCES OF INFORMATION USED IN THIS REPORT.

Home Economic Division, U. S. Food Administration.

Office of Home Economics, U. S. Department of Agriculture.

— McCollum, E. V., "The relation of the unidentified dietary factors, the fat soluble A and the water soluble B of the diet of the growth-promoting properties of milk," *Journal Biological Chemistry*, 27 : 1, 33-43, 1916.

Manuscript about to be published jointly by U. S. Department of Agriculture and U. S. Food Administration on Demonstrations in Home Economics. Chapter on "Milk," by Flora Rowe and Lucile Brewer.

Rose, Flora, *Milk a Cheap Food*, New York State College of Agriculture, Cornell reading course, Food Service, Lesson III.

Rose, Mary, *Feeding the Family*.

Sherman, Henry C., *Food Products*.

Skim milk information compiled by Dr. Katharine Blunt, of the University of Chicago, now with the Home Economics Office, Department of Agriculture.

U. S. Department of Agriculture, *Farmers' Bulletins* 142, 487, 808.

(b) Such ash constituents as lime and phosphorus; milk is comparatively rich in phosphorus and is the richest source of available lime; that is, of lime that occurs in such form and amounts as may be eaten and digested by a child so as to provide for normal growth and health.

C. *Milk as one of the body regulating substances.*—For certain “fat-soluble” and “water-soluble” factors that promote growth, milk or eggs or meat fats must be depended upon. Milk contains both of these vital factors.

COMPARATIVE FUEL VALUE OF VARIOUS DAIRY PRODUCTS.

A. The following tabular data are adapted from “The use of milk as food” (Farmers’ Bulletin 363, U. S. Department of Agriculture):

Dairy products—Comparative fuel values in calories per pound.

Whole milk.....	310
Skim milk.....	165
Unsweetened condensed milk.....	780
Buttermilk.....	160
Cream.....	865
Butter.....	3,410
Cream cheese.....	1,950
Cottage cheese.....	510
Infant foods (milk plus starch).....	1,780
Milk powder.....	1,715

B. *The case for skim milk:*

(a) Extracts from Dr. Blunt’s report:

Skim milk is a nutritious food, containing practically all of the whole milk except the fat.

In fuel value, a quart of skim milk is about equal to a pint of whole.

Skim milk has practically all the protein of whole milk, amounting in a quart to about the protein contained in 5 eggs, or about 6 ounces of meat, or 12 ounces of bread. The protein of skim milk is of the highest grade both for growth and maintenance. Certain valuable compounds of whole milk are in skim milk, including the especially valuable calcium and lactose. In cookery its uses are many and it improves both nutritive value and flavor of cooked food.

(b) The Commission of Milk Standards writes:

“Whereas the pressure of the cost of living is increasing rapidly and vast quantities of nutritious and available food are now going to waste, and laws prohibiting the sale of skim milk have no public significance; therefore, the commission recommends that the use of skim milk as a food be approved, and urges the repeal of laws wherever they exist that prohibit the sale of skim milk as a food”

(c) The Boston experiments show that skim milk can be distributed from the wagon in poorer sections of cities, cutting down the overhead involved in house-to-house delivery and rendering it practicable

to place it on the market at lower prices than now obtained over the retail counter or f. o. b. kitchen. The Boston summer experiments have been criticized because the milk spoiled before being used. This will not occur in winter. In summer this can be avoided by buying less at a time and by boiling any left overs for use in milk cookery.

QUOTATIONS FROM AUTHORITIES REGARDING THE FOOD VALUE OF MILK.

A. From the Home Economics Division of the Food Administration:

"Cows milk as such contains in every quart nearly $34\frac{1}{2}$ ounces out of which a little over an ounce of tissue building food (protein) nearly $1\frac{1}{2}$ ounces of fat and over $1\frac{1}{2}$ ounces of sugar, which together represents 674 units (calories). In animal matter it is high in calcium solids. A quart of milk contains more than a saturate quart of lime water; therefore, its use in the daily diet contains an abundance of bone-forming material.

"Each of those calories has a part of the curd of the milk and in that form has a higher food value than the same amount of calories found in any of the grains. Milk tends to be either neutral or alkaline and therefore is an excellent balance to foods like grains or meat, which have an excess of acid in the mineral matter. This is especially true of oatmeal and wheat; is less true of the entire grain of the corn.

"The fat of milk is in a form which is easy of digestion. It has a pleasing flavor, but much more important than either of these, it contains in solution a substance which stimulates the growth of the young and stimulates the repair of tissues in the adult. This 'growth determinant' must be present in all food, whether of the young or the old. A larger amount must be present in the food of the young."

"The diet is safest, therefore, when built around milk as a center."—
Extracts from Milk as a Food.

B. "Especially in the feeding of children should milk be used freely because of its importance in the many advantages of tissue building and growth-promoting food. A quart of milk a day for each child is a good rule to remember."—H. C. Sherman.

C. "Whole skim milk should never be substituted for whole milk as the principal food in a child's diet. It is as valuable as whole milk as a source of protein and mineral materials in the general diet."—C. L. Hunt and H. W. Atwater.

D. "In no other way can the food habits now prevailing, especially in cities, be so certainly and economically improved as by a more liberal use of milk."—H. C. Sherman.

E. Milk has the distinction of "differing from all others, except possibly eggs, in that it contains fairly good proportions of all the

ingredients necessary for the building and repair of the body, and for supplying it with energy for its activities. Even for adults, milk alone can support life for a considerable time, if not indefinitely."—U. S. Department of Agriculture, Farmers' Bulletin 363.

F. "Milk takes first rank among the foods which promote human welfare. Any condition which threatens the milk supply should be regarded therefore as nothing short of a racial tragedy."—Flora Rose and Lucile Brewer.

G. "It is probable that the quality of the milk supply bears a closer relation to public health than does that of any other food."—H. D. Sherman.

RELATIVE FOOD VALUE OF MILK AND OTHER FOODS.

STATEMENTS BASED ON COMPARATIVE STUDIES OF NUTRITIVE VALUES IN VARIOUS FOODS.

A. "No food bears an investigation of its nutritive values better than does milk."—Flora Rose. For milk furnishes not merely one or two of the primary needs of the body for food, but contributes generously to meeting the demands of all three of the body needs.

B. "In energy-giving power, 1 quart of milk is equivalent to 11 ounces of sirloin steak, or three-quarters of a pound of round steak, or 8½ eggs, or 10.7 ounces of fowl."

"Every dairy cow in her life time supplies in milk an amount of human food equal to that provided by 17 steers."—Bulletin U. S. Department of Agriculture.

C. "A large glass of it yields as much nourishment as a slice of roast beef."—U. S. Department of Agriculture, Farmers' Bulletin 363.

D. "Even such comparisons fail to do justice to the true nutritive value of milk, which is largely due to the peculiar nature of its constituents."—H. C. Sherman.

TABULAR DATA SHOWING THAT DAIRY PRODUCTS RANK HIGH IN NUTRIENTS AS COMPARED WITH CERTAIN OTHER COMMON FOODS.

Nutrients and energy in 1 pound of the water-free edible portion of several food materials.

[From Farmers' Bulletin 363, U. S. Department of Agriculture.]

Food materials.	Protein.	Fat.	Carbohy- drates.	Mineral matter.	Fuel value.
	<i>Pound.</i>	<i>Pound.</i>	<i>Pound.</i>	<i>Pound.</i>	<i>Calories.</i>
Whole milk	0.25	0.31	0.39	0.05	2,475
Skim milk (0.3 per cent fat)	.36	.03	.65	.06	1,835
Buttermilk	.33	.06	.53	.08	1,845
Cheese	.39	.52	.03	.06	2,990
Beef, round	.57	.40	.....	.03	2,750
Smoked ham	.26	.66	.....	.08	3,275
Wheat flour	.13	.01	.85	.01	1,865
Wheat bread	.15	.02	.82	.01	1,865
Potatoes	.10	.01	.85	.04	1,790
Apples	.03	.03	.92	.02	1,885

"The only fair way to estimate the real value of a food is to determine, first, what the body needs from food; second, how the food under question meets those needs, and finally, whether some other food may be used to replace it equally well and for less money."—Flora Rose.

GENERALIZATIONS.

A. Comparative costs of milk as a product in relation to its raw materials:

(a) "From a given quantity of food materials that man can not eat, about three times as much human food can be produced in the form of milk as is produced by beef animals."—G. F. Warren.

B. Comparative costs of milk and other foods:

(a) "Milk and its products are the cheapest animal foods we have."

(b) For a given amount of money, milk will furnish more energy value than eggs or meat, being a cheaper source of energy than any common food except certain cereals.

For a given amount of money, milk will furnish a higher per cent of available building materials than almost any other food. Milk is one of the most important sources of factors in food that are essential to growth, health, and body regulatory functions.

Ten cents will buy the following in a few typical foods:

[Adapted from *Milk a Cheap Food*, by F. Rose.]

	Energy.	Protein.	Lime.
	<i>Calories.</i>	<i>Grams.</i>	<i>Grams.</i>
For 10 cents worth in—	672.5	32.00	1.636
Milk at 10 cents a quart.....	840.1	40.00	2.045
Milk at 8 cents a quart.....	271.0	52.26	.019
Round steak at 26 cents a pound.....	234.0	20.60	.149
Eggs at 35 cents a dozen.....	163.0	13.85	.096
Eggs at 55 cents a dozen.....	1,713.5	61.50	.198
White bread at 5 cents a loaf.....	3,601.5	151.30	1.179
Oatmeal at 5 cents a pound.....	4,037.0	104.30	.170
Corn meal at 4 cents a pound.....			

"Taking into consideration the many and important factors which increase the value of milk as a food, above that indicated by its mere proximate composition and food value, and also the fact that it requires no preparation and has no waste, it is believed to be true economy to make liberal use of milk in the diet so long as the milk does not cost twice as much in proportion to the energy it furnished as the average of the food eaten."—Sherman.

RECOMMENDATIONS.

Because of the superlative value of milk in the dietary, the committee recommends:

1. That increased production of milk be encouraged.

A. As a measure of national safety for the present.

B. As a measure of national vitality for the future, the future being bound up in the welfare of children.

2. That consumption of milk should be increased because—

A. A greater consumption of it in cities will result in a better development of the physical condition of the city population, where consumption is 112 quarts per capita, as compared with 288 on the farm.

B. Increased consumption will encourage production.

C. "If the country is to be protected against nutritive disaster, every possible step must be taken to educate the people to a realization that though they may do without meat they should still have milk."—Rose and Brewer.

D. Skim milk and buttermilk should be made available for city consumers.

E. It is of fundamental importance that the milk supply should be not only maintained at its present status but that more milk should be made available for children.

APPENDIX TO REPORT ON PRODUCTION.

In preparing its report on the cost of production the committee voted to omit reports of single farms and bases its report on investigations that included a considerable number of farms. It was agreed to include in the report on costs of production only those farms that produced market milk, omitting the production of milk for manufacturing purposes.

Some data from Michigan on costs of production where milk was sold to condenseries were, therefore, omitted, as were data from Vermont that included farms selling butter and cream. Data from Maine were omitted because they did not include the cost of hauling milk. Data from Indiana were omitted because the feed for the bull was included with that of cows, and because veal calves were credited at their value after having consumed milk, thus making a double credit if milk was all credited to cows. The committee voted to include the following:

- 8 farms Minnesota, submitted by F. W. Peck.
- 25 farms Michigan, 1914, submitted by F. T. Riddell.
- 25 farms Michigan, 1915, submitted by F. T. Riddell.
- 56 farms Broome County, N. Y., submitted by E. G. Misner.
- 21 farms various New York counties, submitted by C. V. Noble.
- 17 farms Massachusetts, submitted by W. H. Bronson.
- 178 farms Connecticut, submitted by G. C. White.
- 160 farms New Jersey, submitted by Frank App.

Some of the reports included charges for managerial ability or business risk. The committee agreed to omit such items.

There is attached hereto a summary of the reports as used:

State, Michigan.

County, Kent, Allegan, Ottawa.

City for which milk was produced, Grand Rapids.

Year ending, March 1, 1914.

Number farms, 25.

Number cows, 459.

Pounds of milk per cow, 6,928.

Pounds of butter fat per cow, 272.54.

Per cent of milk produced in six months beginning October 1, 47.7.

	Amount per cow.	Value per cow.
Costs:		
Grain.....pounds.....	2,400	\$26.68
Hay.....do.....	1,414	11.17
Other dry forage.....do.....	839	3.11
Silage.....do.....	7,067	14.16
Other succulent feed.....do.....	444	.68
Pasture.....days.....	140	8.36
Breeding.....pounds.....	569	1.90
Human labor.....hours.....	215.6	35.31
Horse labor.....do.....	68.0	6.80
Use of buildings.....		8.72
Use of equipment.....		.50
Interest on cows.....		4.94
Depreciation on cows.....		6.07
Bull's price.....		3.00
Miscellaneous.....		7.68
Total costs.....		139.08
Returns other than milk:		
Calves and calf hides.....		3.00
Manure.....tons.....	8	12.00
Feed bags.....		
Total returns other than milk.....		15.00
Net cost of milk.....		124.08

¹ Value per cow, \$82.30.

I have checked the above and find it to be correct.

F. T. RIDDELL,
East Lansing, Mich.

Charges for managerial ability and business risk are omitted in the above.

State, Michigan.

Counties, Kent, Allegan, Ottawa.

City for which milk was produced, Grand Rapids.

Year ending, March 1, 1915.

Number of farms, 25.

Number of cows, 429.

Pounds of milk per cow, 7,157.

Pounds of butter fat per cow, 282.26.

Per cent of milk produced in six months, beginning October 1, 51.2.

	Amount per cow.	Value per cow.
Costs:		
Grain.....pounds.....	2,260	\$24.87
Hay.....do.....	1,707	10.00
Other dry forage.....do.....	1,177	2.90
Silage.....do.....	7,723	15.13
Other succulent feed.....do.....	479	.65
Pasture.....days.....	140	7.66
Bedding.....pounds.....	744	1.59
Human labor.....hours.....	218.6	33.89
Horse labor.....do.....	84.0	8.40
Use of buildings.....		10.33
Use of equipment.....		.48
Interest on cows ¹		4.75
Depreciation.....		10.20
Bull service.....		3.00
Miscellaneous.....		5.03
Total cost.....		138.99
Returns other than milk:		
Calves and calf hides.....		3.00
Manure recovered.....tons.....	8	12.00
Feed bags.....		
Total returns other than milk.....		15.00
Net cost of milk.....		123.99

¹ Value of cow, \$79.12.

I have checked the above and find it to be correct.

F. T. RIDDELL,
East Lansing, Mich.

Charges for managerial ability and business risk are omitted in the above.

State, Minnesota.

County, Rice.

Cities for which milk was produced, Minneapolis and St. Paul.

Years, 1910, 1911, 1912.

Number of farms, 8.

Number of cows, 260.

Pounds of milk per cow, 5,568.

Pounds of butterfat per cow, 189.

Per cent of milk produced in six months, beginning October 1, 49.3.

	Quantity per cow.	Value per cow.
Costs:		
Grain.....pounds..	1,200	\$33.00
Hay (equivalent to all dry forage).....do.....	2,050	15.00
Other dry forage.....do.....		
Silage.....do.....	5,500	13.75
Other succulent feed.....do.....		
Pasture.....days..	167	12.00
Bedding.....do.....		4.50
Human labor.....hours..	144	34.56
Horse labor.....do.....	40	6.00
Use of buildings.....do.....		5.32
Use of equipment.....do.....		2.86
Interest on cow ¹ do.....		6.00
Depreciation (7.45 per cent).....do.....		7.45
Bull service.....do.....		3.00
Miscellaneous.....do.....		2.32
Total costs.....		145.76
Returns:		
Calves and calf hides.....do.....		5.00
Manure recovered ² tons..	10	15.00
Feed bags.....do.....		
Total returns, except milk.....		20.00
Net cost of milk.....		125.76

¹ Value of cow, \$100.

² At barn.

I have checked the above and find it to be correct.

F. W. PECK,
"U" Farm, St. Paul, Minn.

State, New York.

County, Broome.

City for which milk was produced, New York and Binghamton.

Year ending May 1, 1915.

Number of farms, 56.

Number of cows, 798.

Pounds of milk per cow, 5,822.

Pounds of butter fat per cow, 235.

Per cent of market milk produced in six months beginning October 1, 51.4.

	Amount per cow.	Value per cow.
Costs:		
Grain ¹ pounds..	1,633	\$24.01
Hay.....do....	3,617	18.95
Other dry forage.....do....	643	1.79
Silage.....do....	5,600	14.00
Other succulent feed.....do....	840	1.36
Pasture.....days..	158	4.59
Bedding.....		.75
Human labor.....hours..	198.8	28.80
Horse labor.....do....	29.8	4.47
Use of buildings.....		4.91
Use of equipment.....		.52
Interest on cows ²		3.33
Depreciation on cows.....		2.69
Bull service.....		1.38
Miscellaneous.....		5.77
Total costs.....		117.32
Returns, except milk:		
Calves and calf hides.....		2.29
Manure.....tons..	8.2	10.22
Miscellaneous.....		.03
Total returns, except milk.....		12.54
Net cost of milk.....		104.78

¹ Excluding salt and condimental feed.

² Average value per cow, \$66.60.

I have checked the above and find it to be correct.

E. G. MISNER, *Ithaca, N. Y.*

38 PRODUCTION, DISTRIBUTION, AND FOOD VALUE OF MILK.

State, New York.

County, various.

City for which milk was produced, New York and other.

Year ending spring of 1916.

Number of farms, 21.

Number of cows, 368.

Pounds of milk per cow, 6,469.

Pounds of butter fat per cow, 246.

Average test of milk, 3.8.

Per cent of milk produced in six months beginning October 1, 47.4.

	Amount per cow.	Value per cow.
Costs:		
Grain.....pounds..	1,882	\$25.93
Hay.....do.....	2,309	14.50
Other dry forage.....do.....	888	2.40
Silage.....do.....	6,722	15.12
Other succulent feed.....do.....	357	.94
Pasture.....		4.57
Bedding.....		1.87
Human labor.....hours..	153	23.38
Horse labor.....do.....	28	4.09
Use of buildings.....		2.48
Use of equipment.....		1.51
Interest on cows ¹		4.35
Depreciation on cows.....		10.87
Bull service.....		2.23
Miscellaneous.....		3.81
Total costs.....		118.05
Returns other than milk:		
Calves and calf hides.....		9.67
Manure.....tons.....	6.74	6.97
Miscellaneous.....		.29
Total returns other than milk.....		16.93
Net cost of milk.....		101.12

¹ Average value per cow, \$37.

I have checked the above and find it to be correct.

C. V. NOBLE, *Ithaca, N. Y.*

State, New Jersey.

County, Sussex.

City for which milk was produced, New York.

Year ending May 14, 1914.

Number farms, 160.

Number cows, 3,866.

Pounds of milk per cow, 6,491.

Pounds of butter fat per cow, ¹207.7.

Per cent of milk produced in six months beginning October 1, ²47.6.

	Amount per cow.	Value per cow.
Costs:		
Grain.....pounds..	2,577	\$38.66
Hay.....do..	3,167	21.75
Other dry forage.....do..	665	2.59
Silage.....do..	2,074	5.19
Other succulent feed.....do..		
Pasture.....days..	120-150	8.00
Bedding.....do..		
Human labor.....hours..	182.6	27.03
Horse labor.....do..	20.1	3.35
Use of buildings.....		8.19
Use of equipment.....		.45
Interest on cows ³		4.10
Depreciation on cows (8 per cent).....		6.56
Bull service.....		2.40
Miscellaneous.....		2.30
Total costs.....		132.57
Returns other than milk:		
Calves and calf hides.....		6.53
Manure recovered.....		10.00
Feed bags.....		
Total returns other than milk.....		16.53
Net cost of milk.....		116.04

¹ Per cent butter fat obtained from cow testing association records from this county.

² Taken from 30 records selected at random.

³ Value of cow, \$82.

I have checked the above and find it to be correct.

FRANK APP,
New Brunswick, N. J.

40 PRODUCTION, DISTRIBUTION, AND FOOD VALUE OF MILK.

State, Massachusetts.

County, Middlesex, Franklin, Essex, Worcester, Bristol, Hampshire, Hampden, and Norfolk.

City for which milk was produced, Boston and other Massachusetts cities.

Year ending April 30, 1917.

Number of farms, 17.

Number of cows, 323.

Pounds of milk per cow, 5,005.

Pounds of butter fat per cow, don't know.

Per cent of milk produced in six months beginning October 1, don't know.

	Amount per cow.	Value per cow.
Costs:		
Grain.....pounds.....	2,430	\$45.79
Hay.....do.....	3,661	30.44
Other dry forage.....do.....	1,196	5.42
Silage.....do.....	4,098	10.55
Green soiling crops.....do.....	1,408	2.78
Pasture.....		5.47
Human labor.....hours.....	150	40.20
Horse labor.....do.....	9	1.86
Bedding.....		1.01
Use of buildings and water.....		6.82
Use of equipment.....		1.67
Depreciation on cow.....per cent.....	9.05	6.91
Interest on cow.....do.....	6	4.90
Bull service.....		3.40
Taxes and insurance.....	\$1.53	1
Veterinary services, drugs.....	\$0.83	
Ice.....	\$1.23	
Miscellaneous.....	\$1.31	4.90
Total costs.....		172.12
Credits:		
Calf.....	.85	5.39
Manure.....tons.....	8.1	16.60
Total credits.....		21.99
Net cost of milk.....		150.13

The above is a copy of data submitted by Wesley H. Bronson, Amherst, Mass.

The committee combined salt hay and corn stover under the heading "other dry forage."

It omitted \$14.26 for overhead charges.

State, Connecticut.

County, all.

City for which milk was produced, several.

Year ending, April 30, 1917.

Number of farms, 178.

Number of cows, 3,258.

Pounds of milk per cow, 6,009.

Pounds of butter fat per cow, 225 (estimated).

Per cent of milk produced in 6 months beginning October 1, 50.5 per cent actual for 47 farms.

	Amount per cow.	Value per cow.
Costs:		
Grain.....pounds..	2,100	\$42.25
Hay.....do...	3,680	28.63
Other dry forage.....do...	200	.74
Silage.....do...	7,380	19.02
Other succulent feed.....do...	820	1.85
Pasture.....days..	150	7.17
Bedding.....		1.63
Human labor.....hours..	163	39.94
Horse labor.....do...	24.5	4.73
Use of buildings.....		9.08
Use of equipment.....		1.28
Interest on cows.....		6.53
Depreciation on cows.....		5.12
Bull service.....		2.38
Miscellaneous.....		6.27
Total costs.....		176.62
Returns other than milk:		
Value of calves at birth and calf hides.....		4.19
Manure recovered.....		17.40
Feed bags.....		.46
Total returns other than milk.....		22.05
Net cost of milk.....		154.57

I have checked the above and find it to be correct.

G. C. WHITE, *Dairy Husbandman, Storrs, Conn.*



